

*Indian J. Phys.* **82**, Index (Author & Subject), 1715-1747 (2008)

# INDIAN JOURNAL OF PHYSICS

**Volume 82**

AND

PROCEEDINGS OF THE

Indian Association for the Cultivation of Science, Vol. 91

**Author & Subject Index**  
(2008)



*(Published by the Indian Association for the Cultivation of Science  
in Editorial Collaboration with the Indian Physical Society)*



# INDIAN JOURNAL OF PHYSICS

## AUTHOR INDEX\*

VOLUME 82

(2008)

The following *abbreviations* are used :

- (E) *Erratum*
- (N) *'Note'*
- (P<sub>1</sub>) *Proceedings (Part I & II) of the National Symposium entitled Condensed Matter Days-2006 (CMDAYS-06) organised by the Department of Physics, Tezpur University, P.O.-Nappam, Tezpur-784 028, Assam, India held at Tezpur, India, during August 29-31, 2006*
- (P<sub>2</sub>) *Proceedings (Part I & II) of the 5<sup>th</sup> Biennial Conference of the Physics Academy of the North East (PANE) held at Department of Physics, Gauhati University, Guwahati-781 014, Assam, India during March 1-2, 2007*
- (R) *'Review'*
- (RC) *'Rapid Communication'*
- (S<sub>1</sub>) *Special Issue on 80 years of the Discovery of Raman Effect & 175th Birth Anniversary of Dr. Mahendra Lal Sircar*
- (S<sub>2</sub>) *Special Issue on "Electrodynamics of Classical Charged Particles"*

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<b>Abdelkhalek Mohamed M</b>	Radiation and dissipation effect on unsteady MHD micropolar flow past an infinite vertical plate in porous medium with time dependent suction	415

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<i>Ahmed Sk F, (Mitra M K and Chattopadhyay K K)</i>	Electrical characterization of multiwalled carbon nanotubes synthesized by DC-plasma enhanced chemical vapor deposition technique ( $P_1$ )	223
<i>Anbarasan P M, (Meenakshi G, Jeyapriya K, Subramanian M K and Subramani K)</i>	Growth, structural and optical studies on organic single crystal imidazole	1473
<b>B</b>		
<i>Banerjee B and (Roy S K)</i>	A plausible explanation of non-zero isotope shifts in superconductors ( $P_1$ )	333
<i>Barman Jayanta and (Sarma K C)</i>	Structural and optical properties of CdS nanoparticles	855
<i>Baruah K K</i>	Bianchi type-1 string cosmology with a scalar field ( $P_2$ )	513
<i>Baruah Rulee, (Duorah Kalpana and Duorah H L)</i>	The rapid neutron capture process in an explosive astrophysical environment ( $P_2$ )	523
<i>Behera D, (Biswal R, Mohapatra U K and Mishra N C)</i>	Microscopic inhomogeneity induced thermal fluctuation in high temperature superconductors ( $P_1$ )	317
<i>Bezares-Roder Nils M and (Nandan Hemwati)</i>	Spontaneous symmetry breakdown and critical perspectives of Higgs Mechanism	69
<i>Bhadra J and (Sarkar D)</i>	Field effect transistor from dispersion polymerized aniline ( $P_2$ )	795
<i>Bhakuni Gaurav (and Bisht Shuchi)</i>	Interaction of an electric charge in the radial field of a heavy dyon	1563
<i>Bhattacharjee B, (Debnath B and Sengupta S)</i>	Effect of collision geometry on the multiplicity of secondary charged particles emitted from $^{84}\text{Kr}$ -AgBr interactions at 950 MeV/A ( $P_2$ )	735

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<i>Bhattacharjee S and (Baishya B)</i>	A study of superconducting order parameter fluctuation effects in $\text{Dy}_2\text{O}_3$ , $\text{Eu}_2\text{O}_3$ and $\text{Pr}_6\text{O}_{11}$ substituted compounds	45
<i>Bhunia S, (Biswas S, Sarkar D and Sarkar P P)</i>	Experimental investigation on single layer single-feed dual frequency (dual band) reduced sized slotted square microstrip patch antenna (RC)	829
<i>Bishoyi K C and (Rout G C)</i>	Study of antiferromagnetism in cuprates through Raman active phonon peaks ( $P_1$ )	215
<i>Biswal R, (John J, Behera D, Mallick P, Kumar S, Kanjilal D and Mishra N C)</i>	Ion velocity dependent secondary electron induced point defects in SHI irradiated solids ( $P_1$ )	147
<i>Biswas S, (Hussain S A and Bhattacharjee D)</i>	Orientation of carbazole molecule in the mixed Langmuir-Blodgett films ( $P_1$ )	173
<i>Bora K</i>	Type-II seesaw in $\text{SO}(10)$ theories with spontaneous CP violation ( $P_2$ )	753
<i>Borah Rashmi Rekha, (Bhuyan K and Bhuyan P K)</i>	Correlation distance of ionospheric total electron content in the Indian low latitude region ( $P_2$ )	545
<i>Borah Sankar Moni, (Pal Arup Ratan, Bailing Heremba and Chutia Joyanti)</i>	Titanium nitride nano-structure by DC magnetron sputtering plasma ( $P_1$ )	209
<i>Borah Sankar Moni, Pal Arup Ratan, Bailing Heremba and Chutia Joyanti)</i>	Hardness study of titanium nitride thin films deposited on bell-metal by cylindrical magnetron sputtering ( $P_2$ )	741
<i>Bordoloi Namita Sharma and (Choudhury D K)</i>	Form factors and charge radii of light and heavy flavoured mesons in a QCD inspired quark model with two loop static potential ( $P_2$ )	779

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<i>Borse R Y and (Garde A S)</i>	Effect of firing temperature on electrical and structural characteristics of SnO <sub>2</sub> thick films	1319
<i>Borthakur G G and (Baishya B)</i>	Mixing dynamics and microscopic correlation of associated liquids	459
<b>C</b>		
<i>Castillo G F Torres del</i>	Hidden symmetries of the motion of a charged particle in a uniform magnetic field ( $S_2$ )	1105
<i>Chakraborty B and (Pal R R)</i>	A novel high speed fully differential CMOS amplifier	403
<i>Chaliha S, (Borah M N, Sarmah P C and Rahman A)</i>	Optical and electrical properties of thermally evaporated ZnSe thin films ( $P_1$ )	303
<i>Chaliha S, (Borah M N, Sarmah P C and Rahman A)</i>	A study of current - voltage characteristics of ITO/(p)Si heterojunctions ( $P_2$ )	595
<i>Changmai R and (Baruah G D)</i>	Cavity-modified laser induced fluorescence of a blended system of polymer film ( $P_2$ )	679
<i>Chattaraj P K and (S Giri)</i>	A minimum electrophilicity perspective of the HSAB principle ( $E$ )	467
<i>Chatterjee Achintya K, (Bari Md Washimul and Chaudhury Asit K)</i>	Class transitions of compact objects Cygnus X-1 and Cygnus X-3	1429
<i>Chatterjee Prasanta and (Kundu Sanjib Kumar)</i>	Large amplitude solitary waves in four component dusty plasma	447
<i>Chaudhuri Jyotipratim Ray and (Barik Debashis)</i>	Self consistent microscopic theory of frictional ratchet in a nonequilibrium environment	1577
<i>Choudhury D K and (Gogoi Rupiyoti)</i>	An analysis of self-similarity in quark and gluon densities at small $x$ ( $P_2$ )	621

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<i>Choudhury Dilip Kumar and (Bhattacharjee Buddhadeb)</i>	Foreword ( $F_2$ )	495
<i>Choudhury Joydeep, (Sarkar Nirmal Kumar and Bhattacharjee Ramendu)</i>	Algebraic approach to analyze the vibrational spectra of tetrahedral molecules ( $P_2$ )	561
<i>Chowdhury Partha, (Ray P C and Ray Saibal)</i>	Periodicity of ~155 days in solar electron fluence ( $N$ )	95
<i>Chowdhury S and (Choudhury A)</i>	Optical and structural studies of SHI irradiated $\text{SiO}_2$ coated IV-VI semiconductor quantum dots ( $P_1$ )	311
<b>D</b>		
<i>Das Abhijeet and (Saikia A)</i>	Quark contribution in the evolution equation of the scaling violation of $F_2$ ( $P_2$ )	789
<i>Das D, (Ahmed G A and Choudhury A)</i>	Studies on water vapour droplets using a laser based air quality monitoring system ( $P_2$ )	539
<i>Das U, (Mohanta D, Bordoloi A K, Singh F, Tripathi A, Avasthi D K and Choudhury A)</i>	Structural and optical properties of 150 MeV $\text{Tr}^{+11}$ irradiated doped nanostructures ( $P_1$ )	163
<i>De Udayan, (Venkatesh Manisha, Mehzabin S Shaikh and Venkataramani B)</i>	Study of elemental composition in some II-VI oxides by atomic absorption spectroscopy ( $P_1$ )	259
<i>Deb S and (Sarkar D)</i>	Fabrication of silver/cross-linked polyvinyl alcohol nanoparticles by hydrothermal method ( $P_2$ )	715
<i>Debnath B, (Talukdar R and Bhattacharjee B)</i>	Emission characteristics of intermediate mass fragments on the residual part of the projectile nucleus ( $P_2$ )	633
<i>Deo B B and P K Mishra</i>	Calculation of the masses and the running masses of the quarks and leptons from electroweak to supersymmetric grand unification	1529

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<i>Dev Poulumi and (Basu Saurabh)</i>	<i>d</i> -wave correlations for anisotropic superconductors ( $P_1$ )	289
<i>Devi K Nomita, (Sarma H Nandakumar and Kumar Sanjiv)</i>	Proton induced X-ray emission (PIXE) and proton induced $\gamma$ -ray emission (PIGE) studies of some medicinal plants of north east India ( $P_2$ )	747
<i>Devi O Babynanda and (Singh C Amuba)</i>	Dirac and Infeld-Hull ladder operator methods for a modified oscillator potential ( $P_2$ )	551
<i>Devi R, Kalita P K, Purkayastha P and Sarma B K )</i>	Synthesis and optical characterization of CdS nanocomposites ( $P_2$ )	707
<i>Devi Th Gomti and (Kumar K)</i>	Solvent dependent Raman anisotropic bandwidth study in carbonyl containing molecule: role of van der Waals' volume in intermolecular interactions ( $P_2$ )	571
<i>Dhokne R J, (Sangawar V S, Chikhalikar P S, Thool V S, Ubale A U and Junghare A R)</i>	Structural characterization and electrical conductivity of naphthalene doped polyblend films of polystyrene (PS) and polymethyl methacrylate (PMMA)	1309
<i>Dubey J D, (Kushwaha J P and Prasad Bhimlal)</i>	Surface stress calculation for one-monolayer adsorption of As on the Si(001) and the Ge(001) surfaces ( $N$ )	1701
<i>Dutta N, (Mohanta D and Choudhury A)</i>	Synthesis and characterizations of quality PbS quantum dots in SBR matrix ( $P_1$ )	327
<i>Dutta P, (Duorah K and Duorah H L)</i>	Nucleocosmochronology of Dergaon meteorite ( $P_2$ )	673
<i>Dutta Tapati and (Taraſdar Sujata)</i>	Chaotic behaviour of population on a square lattice ( $P_1$ )	201



<b>Author</b>	<b>Subject</b>	<b>Page</b>
<b>E</b>		
<i>Editor-in-Chief, IJP</i>	Forword ( $S_1$ )	949
<i>Eriksen E and (Grøn Ø)</i>	The significance of the Schott energy in the electrostatics of charged particles and their fields ( $S_2$ )	1113
<b>G</b>		
<i>Ganesh V and (Rao K Kishan)</i>	Surface and hardness studies on as-grown {100} faces of zinc (tris) thiourea sulphate crystals	1293
<i>Ghosh Dipak, (Deb Argha, Haldar Prabir Kumar and Guptaroy Sima)</i>	Fluctuation and fractal characteristics of ring like and jet like events produced at SPS energies	1339
<i>Gill Tepper L and (Zachary Woodford W)</i>	Proper-time foundations for classical electrostatics ( $S_2$ )	1159
<i>Goivani Jayesh and (Joshi Mihir J)</i>	Growth and characterization of gel grown potassium hydrogen levo-tartrate crystals	1485
<i>Gogoi A and (Bhattacharyya N S)</i>	Development of LDPE/TiO <sub>2</sub> composite as substrate material in microwave integrated circuits ( $P_1$ )	341
<i>Gogoi Ankur and (Ahmed Gazi Ameen)</i>	A T-matrix approach for morphological characterization of spherical nanoparticles using laser ( $P_2$ )	567
<i>Gogoi P, Konwar K and Baishya B)</i>	Performance of thermally deposited polycrystalline Ge-thin film transistors with a copper interlayer fabricated on glass substrates ( $P_2$ )	577
<i>Gogoi Purabi, (Ansari Taufique A and Agarwal Pratima)</i>	Steady state photo carrier grating technique for measurement of charge carrier diffusion length ( $P_1$ )	179
<b>H</b>		
<i>Hazarika Farzana B and (Baruah G D)</i>	Vector model of quantum interference laser ( $P_2$ )	761

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<i>Hussain A M Pharhad and (Kumar A)</i>	Electrochemical synthesis and characterization of co-polymers of aniline and pyrrole ( $P_1$ )	349
<b>J</b>		
<i>Janarthanan S, (Kumar T Kishore, Selvakumar S, Pandi S, Sagayaraj P and Anand D Prem)</i>	Investigation on the mechanical, dielectric and photoconductivity properties of N-Methyl Urea NLO single crystals	1287
<i>Jangid R A</i>	Dielectric study of particulate material in e.m. field at microwave frequencies	833
<b>K</b>		
<i>Kalita K</i>	Interaction of loosely bound radioactive and stable nuclei via elastic scattering and fusion cross sections ( $P_2$ )	801
<i>Karmakar Mahua, (Sarkar Bikash Kumar, Barman Supriya, Mazumdar P S, Singh S Dorendrajit, Singh W Sambhunath and Bhattacharya Manabesh)</i>	Evaluation of kinetic parameters from thermoluminescence glow curve	1495
<i>Kaushal R S</i>	A model for quark-gluon plasma with pentaquark baryons and tetraquark mesons	891
<i>Khan Ayan, (Atre Rajneesh and Panigrahi Prasanta K)</i>	Complex envelope soliton in Bose-Einstein condensate with time dependent scattering length ( $P_1$ )	185
<i>Khare P K, (Bangre Gautama, Mishra Pankaj and Mishra Jyoti)</i>	Exploration of space charge behaviour of polyvinyl carbazole using measurement of thermally stimulated discharge current	1301
<i>Kochhar Rajesh</i>	Cultivation of Science in the 19th Century Bengal ( $S_1$ )	1003

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<b>Konwar K, (Gogoi P and Baishya B)</b>	Naphthacene and pentacene based organic thin film transistors with $\text{La}_2\text{O}_3$ as the gate insulator ( $P_2$ )	719
<b>Krori K D, (Dutta Sabita and Das Kanika)</b>	Direct derivation of Sagnac effect ( $P_2$ )	665
<b>Krori K D, (Dutta Sabita, Das Kanika and Mahanta Chandra Rekha)</b>	Raychaudhuri equation, big bang and accelerating universe ( $P_2$ )	531
<b>Kumar A, (Hussain A M P and Avasthi D K)</b>	Swift $\text{Ni}^{2+}$ ion irradiation effects on electrodeposited polypyrrole for application as electrode in supercapacitors ( $P_1$ )	273
<b>Kumar R, (Ray R P K and Tiwary S N)</b>	Double photoionization of Ar ( $1s^2 2s^2 2p^6 3s^2 3p^6$ ) $^1S_0$ ( $N$ )	1395
<b>Kumar Santosh and (Pal Janki)</b>	SEPs associated CMEs affecting near earth environment	1255
<b>Kushwaha Jitendra Kr, Arora V P, Raina K K and Agarwal V K)</b>	Optical and texture property studies in a nematic liquid crystal mixture ( $N$ )	1385
<b>Lakshmanan Palaniappan</b>	Validity of theoretical models in estimating the sound velocity in toluene-alcohol mixtures	1503
<b>Lopez-Bonilla Jose Luiz</b>	Foreword ( $S_2$ )	1103
<b>M</b>		
<b>Maiti Santanu K</b>	Persistent current and low-field magnetic susceptibility in $n$ -fold twisted Moebius strips ( $P_1$ )	281
<b>Medhi Amal, (Basu Saurabh and Kadolkar C Y)</b>	Variational Monte Carlo study of magnetic correlations in bilayer $t$ - $J$ model ( $P_1$ )	251

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<i>Meitei Irom Ablu and (Singh K Yugindro)</i>	The space distribution of QSOs ( $P_2$ )	519
<i>Melagiriappa E, (Jayanna H S and Chougule B K)</i>	Structure and DC conductivity studies of $\text{Sm}^{3+}$ substituted Mg-Zn ferrites	863
<i>Mihaela Osaci</i>	Determination of the effective magnetic anisotropy constant of ferrite nanoparticles dispersed in organic matrix	1671
<i>Mirafzali S Y and (Sarbishaei M)</i>	The effect of anisotropy and external magnetic field on the thermal entanglement in two spin-one system	59
<i>Mishra A P, (Mishra V K, Tripathi Roopali and Mishra B N)</i>	Heliographic distribution of X-ray solar flares and their association with geomagnetic disturbances in relation to solar radio emissions and coronal mass ejections	1655
<i>Mishra D K, (Mishra P K, Sahu D R, Behera D and Roul B K)</i>	Effect of Ho and Nd substitution in $\text{La}_{0.67}\text{Ca}_{0.33}\text{MnO}_3$ CMR manganites ( $P_1$ )	155
<i>Mohanta D</i>	Foreword ( $P_1$ )	145
<i>Mukherjee Moitrayee, (Mukhopadhyay Anamika and Chakraborty Tapas)</i>	Raman optical activity : a novel version of chiroptical spectroscopy ( $S_1$ )	987
<b>N</b>		
<i>Nandan H and (Chandola H C)</i>	The ideas of dual description of quantum chromodynamics ( $R$ )	1619
<i>Nath P P and (Joarder R N)</i>	A note on the dynamical structure of liquid LiNa alloy ( $N$ )	913
<i>Nayak P K and (Ravi S)</i>	Study of critical current density from ac susceptibility measurements in $(\text{La}_{1-x}\text{Y}_x)_2\text{Ba}_2\text{CaCu}_5\text{O}_z$ superconductors ( $P_2$ )	603

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<b>O</b>		
<i>Oza A T, (Solanki G K, Amin Anand and Trivedi Parimal)</i>	UV-visible-near IR and infrared spectroscopy of $\beta$ -carotene and $\beta$ -carotene-iodine complex	1513
<i>Pakzad Hamid Reza and (Javidan Kurosh)</i>	Solitary waves in dusty plasma with variable dust charges and nonthermal ions	1689
<i>Parga G Ares De, (Ortiz-Dominguez M and Mares R)</i>	A deduction of the Landau-Lifshitz equation of motion without mass renormalization in classical electrodynamics ( $S_2$ )	1179
<i>Phukan Manisha and (Sarma B K)</i>	X-ray and infrared spectroscopic studies of the molecular structure of 3-(2,4-dichlorophenyl)-1-phenylprop-2-en-1-one ( $P_2$ )	773
<b>R</b>		
<i>Raghusankar M, (Sarma Sidananda, Ravi S and Srinivasan A)</i>	Magnetic and martensitic transformations in Ni-Fe-Ga alloy ( $P_1$ )	169
<i>Raghuwanshi Sanjeev Kumar and (Talabattula Srinivas)</i>	Asymmetric group velocity dispersion and pulse distortion in a uniform fiber Bragg grating	1681
<i>Raghuwanshi Sanjeev Kumar and (Talabattula Srinivas)</i>	Applications of degenerate/non-degenerate modes coupling in an optical waveguide	1373
<i>Rai S B and (Singh Shiv Kumar)</i>	Optogalvanic detection of NaNe and Na <sub>2</sub> in a hollow cathode lamp	885
<i>Raman Prof. C V, (FRS)</i>	A New Radiation ( $S_1$ )	951
<i>Rastogi R G and (Chandra H)</i>	IMF and geomagnetic field : A new feature	1247
<i>Ray Saibal, (Usmani A A, Rahaman F, Kalam M and Chakraborty K)</i>	Electromagnetic mass model admitting conformal motion ( $S_2$ )	1191

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<b>Reddy B Sudhakar and (Buddhudu S)</b>	Optical characterization of $\text{Nd}^{3+}$ : fluoro-phospho-borate glasses	871
<b>Roy Amit</b>	Use of low energy accelerators ( $P_2$ )	497
<b>Roy Utpal and (Ho Y K)</b>	Computation of doubly-excited $1s^23/3/1^1P^o$ and $1F^o$ states in beryllium-like ions	387
<b>S</b>		
<b>Sable M C, (Vyawahare S K, Labde B K and Shamkuwar N R)</b>	Structural and magnetic properties of $\text{Pb}^{4+}$ substituted Li-ferrites	39
<b>Sachs Mendel</b>	On entropy and objective reality ( $N$ )	907
<b>Sahu Devendra K, (Khare P K and Yadav V S)</b>	Steady state conduction current of polyvinylidene fluoride film electrets	843
<b>Sahu P P</b>	Silicon oxinitride: a material for compact waveguide device ( $P_1$ )	265
<b>Saikia Nayanmoni, (Tiru Banty, Handique Dudumoni, Boruah P K and Boruah K)</b>	Programmable trigger circuit for UHE cosmic ray detection by mini-array method : simulation with VHDL ( $P_2$ )	627
<b>Santra S B and (Deb D)</b>	Sandpile under rotational constraint ( $P_1$ )	295
<b>Santra S B and (Chanu S Ranjita)</b>	A numerical model for studying glass dissolution in water ( $P_2$ )	615
<b>Sarkar Nirmal Kumar, (Choudhury Joydeep and Bhattacharjee Ramendu)</b>	Algebraic approach : study of vibrational spectra of some linear triatomic molecules ( $P_2$ )	767
<b>Sarma Kali Prasad and (Das Monimala)</b>	Physico-chemical characteristics of ground water of Tezpur town ( $P_1$ )	189
<b>Sarma Sidananda and (Srinivasan A)</b>	Influence of cooling rate on the properties of ferromagnetic shape memory alloy ( $P_2$ )	701

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<i>Sarmah K, (Sarma R and Das HL)</i>	Effect of wavelength and intensity of illumination on the photoelectronic properties of CdSe thin films ( $P_2$ )	585
<i>Selvanayagam S, (Velmurugan D, Yamane T and Suzuki A)</i>	High throughput structure determination for single-wavelength laboratory X-ray source anomalous diffraction data sets using iodinated tyrosines	27
<i>Sengupta P, (Mondal S and Chakravorty J N)</i>	Microwave reflection on echelon cum lamellar grating and its applications in astrophysics	1441
<i>Shekar N V Chandra and (Sahu P Ch)</i>	Strong Solids ( $R$ )	1645
<i>Shikha Prajwalit, (Sinha V K and Dubey J D)</i>	An evaluation of plasmon frequency associated with charge carriers for heavy electron systems	1665
<i>Shinde G N and (Bhagat S R)</i>	Universal second order Switched-Capacitor filter for different $Q$ values	1329
<i>Singh Bharat</i>	A forgotten variational principle ( $R$ )	11
<i>Singh Rajinder</i>	80 years ago – the Discovery of the Raman Effect at the Indian Association for the Cultivation of Science, Kolkata, India ( $S_1$ )	969
<i>Singh K D and (Mathew Alphonsa)</i>	Injection/suction effect on an oscillatory hydromagnetic flow in a rotating horizontal porous channel	435
<i>Singh K Kunjabali and (Das H L)</i>	Microstructures, stress, strain and surface characterization of TD polycrystalline CdS thin films ( $P_2$ )	685
<i>Singh Krishna K, (Singh A K, Altaf M, Ahmad M M, Koul B L, Lalmani, Singh R P, Singh Jaipal and Kumar Balraj)</i>	Magnetospheric electron temperatures inferred from whistler observations at low latitudes	1447

<b>Author</b>	<b>Subject</b>	<b>Page</b>
<i>Singh Krishna Kumar, (Singh Shubha, Patel R P, Singh Jaipal, Singh A K, Singh Ashok K, Singh R P and Lalmani)</i>	Estimation of magnetospheric electron densities from low latitude whistlers	379
<i>Singh Sunita and (Raj Deo)</i>	Elastic cross section for electron scattering by $N_2O$ molecule	1265
<i>Sinha Santanu and (Santra S B)</i>	Finite-size-scaling theory for anisotropic percolation models ( $P_1$ )	919
<i>Soibam Ibetombi, (Phanjoubam Sumitra, Sharma H Basantkumar and Sarma H N K)</i>	Synthesis of lithium zinc ferrite powders by citrate precursor gel formation method ( $P_2$ )	611
<i>Sreenivasulu A, (Prasad T N V K V and Buddhudu S)</i>	Luminescence properties of $RE^{3+}$ ( $Eu^{3+}$ $Sm^{3+}$ and $Dy^{3+}$ ) doped $LiNbO_3$ ceramic powders	51
<i>Srinivasan A and (Pattanaik A K)</i>	Fragility of Pb modified germanium chalcogenide glasses ( $P_2$ )	505
<i>Srivastava S K, (Kar Manoranjan and Ravi S)</i>	Preparation, characterization and magnetic properties of hexagonal $Y_{1-x}Ce_xMnO_3$ ( $P_1$ )	195
<i>Srivastava S K, (Kar Manoranjan and Ravi S)</i>	Electrical transport and magnetic properties of $La_{0.85}Ag_{0.15}(Ml_{1-y}Al_y)O_3$ compounds ( $P_2$ )	695
<b>U</b>		
<i>Uddin M M, (Hoque S Manjura, Mahmud MD Sultan, Hakim M A and Chowdhury F U Z)</i>	Magnetocaloric effect in amorphous ribbon based on finemet	1457
<i>Upadhyay A K, (Dhoble S J and Kher R S)</i>	Luminescence studies on $\gamma$ - irradiated Dy activated $KNaSO_4$ phosphors	1467
<i>Ürer Güldem and (Özdemir Leyla)</i>	Electric dipole transitions for Mg XI ( $Z = 12$ )	1273



<b>Author</b>	<b>Subject</b>	<b>Page</b>
<i>Uttam K N, (Singh Renu and Tandon Pavitra)</i>	A new band system of the MgBr molecule	1523
<b>W</b>		
<i>Whitney Cynthia Kolb</i>	Expanding the realm of 'classical' electrodynamics ( $S_2$ )	1205
<i>Wary G and (Rahman A)</i>	Comparative studies on optical parameters of CdTe and ZnO thin films ( $P_2$ )	723
<b>Y</b>		
<i>Yadav M K and (Surbhi)</i>	Electronic spectral studies of 4-bromo-2-fluoro phenol in various solvents ( $N$ )	117
<i>Yaremko Yuriy</i>	Two-body problem with retarded interactions and radiation reaction in classical electrodynamics ( $S_2$ )	1139
<i>Yurtseven H and (Tilki Ö)</i>	Critical behaviour of the thermodynamic quantities near the melting point in the solid phase of hexadecane ( $N$ )	105
<b>Z</b>		
<i>Zoliana B and (Thapa R K)</i>	Application of projection operator method to define basis functions for use in photoemission calculations ( $P_2$ )	729



# INDIAN JOURNAL OF PHYSICS

## SUBJECT INDEX

VOLUME 82

(2008)

### ***Rapid Communication***

Experimental investigation on single layer single-feed dual frequency (dual band)

reduced sized slotted square microstrip patch antenna

S BHUNIA, S BISWAS, D SARKAR AND P P SARKAR ..... 829

### ***Reviews***

A forgotten variational principle

BHARAT SINGH ..... 11

The ideas of dual description of quantum chromodynamics

H NANDAN AND H C CHANDOLA ..... 1619

Strong Solids

N V CHANDRA SHEKAR AND P CH SAHU ..... 1645

### ***Astrophysics, Atmospheric & Space Physics***

Estimation of magnetospheric electron densities from low latitude whistlers

KRISHNA KUMAR SINGH, SHUBHA SINGH, R P PATEL, JAIPAL SINGH,

A K SINGH, ASHOK K SINGH, R P SINGH AND LALMANI ..... 379

IMF and geomagnetic field : A new feature

R G RASTOGI AND H CHANDRA ..... 1247

## SEPs associated CMEs affecting near earth environment

SANTOSH KUMAR AND JANKI PAL ..... 1255

## Class transitions of compact objects Cygnus X-1 and Cygnus X-3

ACHINTYA K CHATTERJEE, MD WASHIMUL BARI AND ASIT K CHAUDHURY ..... 1429

Microwave reflection on echelon cum lamellar grating and its applications  
in astrophysics

P SENGUPTA, S MONDAL AND J N CHAKRAVORTY ..... 1441

Magnetospheric electron temperatures inferred from whistler observations  
at low latitudesKRISHNA K SINGH, A K SINGH, M ALTAF, M M AHMAD,  
B L KOUL, LALMANI, R P SINGH, JAIPAL SINGH AND BALRAJ KUMAR ..... 1447Heliographic distribution of X-ray solar flares and their association with  
geomagnetic disturbances in relation to solar radio emissions and coronal  
mass ejections

A P MISHRA, V K MISHRA, ROOPALI TRIPATHI AND B N MISHRA ..... 1655

**Atomic & Molecular Physics**Computation of doubly-excited  $1s^23/3/{}^1P^o$  and  ${}^1F^o$  states in beryllium-like  
ions

UTPAL ROY AND Y K HO ..... 387

Elastic cross section for electron scattering by  $N_2O$  molecule

SUNITA SINGH AND DEO RAJ ..... 1265

Electric dipole transitions for Mg XI ( $Z = 12$ )

GÜLDEM ÜRER AND LEYLA ÖZDEMİR ..... 1273

**Condensed Matter & Material Physics**High throughput structure determination for single-wavelength laboratory X-ray  
source anomalous diffraction data sets using iodinated tyrosines

S SELVANAYAGAM, D VELMURUGAN, T YAMANE AND A SUZUKI ..... 27

Structural and magnetic properties of  $Pb^{4+}$  substituted Li-ferrites

M C SABLE, S K VYAWHARE, B K LABDE AND N R SHAMKUWAR ..... 39

A study of superconducting order parameter fluctuation effects in  $\text{Dy}_2\text{O}_3$ ,  $\text{Eu}_2\text{O}_3$  and  $\text{Pr}_6\text{O}_{11}$  substituted compounds

S BHATTACHARJEE AND B BAISHYA ..... 45

Luminescence properties of  $\text{RE}^{3+}$  ( $\text{Eu}^{3+}$ ,  $\text{Sm}^{3+}$  and  $\text{Dy}^{3+}$ ) doped  $\text{LiNbO}_3$  ceramic powders

A SREENIVASULU, T N V K V PRASAD AND S BUDDHUDU ..... 51

Dielectric study of particulate material in e.m. field at microwave frequencies

R A JANGID ..... 833

Steady state conduction current of polyvinylidene fluoride film electrets

DEVENDRA K SAHU, P K KHARE AND V S YADAV ..... 843

Structural and optical properties of CdS nanoparticles

JAYANTA BARMAN AND K C SARMA ..... 855

Structure and DC conductivity studies of  $\text{Sm}^{3+}$  substituted Mg-Zn ferrites

E MELAGIRIYAPPA, H S JAYANNA AND B K CHOUGULE ..... 863

Optical characterization of  $\text{Nd}^{3+}$  : fluoro-phospho-borate glasses

B SUDHAKAR REDDY AND S BUDDHUDU ..... 871

Investigation on the mechanical, dielectric and photoconductivity properties of N-Methyl Urea NLO single crystals

S JANARTHANAN, T KISHORE KUMAR, S SELVAKUMAR, S PANDI,

P SAGAYARAJ AND D PREM ANAND ..... 1287

Surface and hardness studies on as-grown {100} faces of zinc (tris) thiourea sulphate crystals

V GANESH AND K KISHAN RAO ..... 1293

Exploration of space charge behaviour of polyvinyl carbazole using measurement of thermally stimulated discharge current

P K KHARE, GAUTAMA BANGRE, PANKAJ MISHRA AND JYOTI MISHRA ..... 1301

Structural characterization and electrical conductivity of naphthalene doped polyblend films of polystyrene (PS) and polymethyl methacrylate (PMMA)

R J DHOKNE, V S SANGAWAR, P S CHIKHALIKAR, V S THOOL,

A U UBALÉ AND A R JUNGHARE ..... 1309

Effect of firing temperature on electrical and structural characteristics of SnO<sub>2</sub> thick films

R Y BORSE AND A S GARDE ..... 1319

Magnetocaloric effect in amorphous ribbon based on Finemet

M M UDDIN, S MANJURA HOQUE, MD SULTAN MAHMUD,  
M A HAKIM AND F U Z CHOWDHURY ..... 1457

Luminescence studies on  $\gamma$  - irradiated Dy activated KNaSO<sub>4</sub> phosphors

A K UPADHYAY, S J DHOBLE AND R S KHER ..... 1467

Growth, structural and optical studies on organic single crystal imidazole

P M ANBARASAN, G MEENAKSHI, K JEYAPRIYA,  
M K SUBRAMANIAN AND K SUBRAMANI ..... 1473

Growth and characterization of gel grown potassium hydrogen levo-tartrate crystals

JAYESH GIVANI AND MIHIR J JOSHI ..... 1485

Evaluation of kinetic parameters from thermoluminescence glow curve

MAHUA KARMAKAR, BIKASH KUMAR SARKAR, SUPRIYA BARMAN,  
P S MAZUMDAR, S DORENDRAJIT SINGH, W SAMBHUNATH SINGH AND  
MANABESH BHATTACHARYA ..... 1495

An evaluation of plasmon frequency associated with charge carriers for heavy electron systems

PRAJWALIT SHIKHA, V K SINHA AND J D DUBEY ..... 1665

Determination of the effective magnetic anisotropy constant of ferrite nanoparticles dispersed in organic matrix

OSACI MIHAELA ..... 1671

## ***General & Interdisciplinary Physics***

The effect of anisotropy and external magnetic field on the thermal entanglement in two spin-one system

S Y MIRAFZALI AND M SARBISHAEI ..... 59

A novel high speed fully differential CMOS amplifier

B CHAKRABORTY AND R R PAL ..... 403

Universal second order Switched-Capacitor filter for different  $Q$  values

G N SHINDE AND S R BHAGAT ..... 1329

## Validity of theoretical models in estimating the sound velocity in toluene-alcohol mixtures

PALANIAPPAN LAKSHMANAN ..... 1503

***Nonlinear Dynamics & Complex Systems***

## Radiation and dissipation effect on unsteady MHD micropolar flow past an infinite vertical plate in porous medium with time dependent suction

MOHAMED M ABDELKHALEK ..... 415

## Injection/suction effect on an oscillatory hydromagnetic flow in a rotating horizontal porous channel

K D SINGH AND ALPHONSA MATHEW ..... 435

***Nuclear Physics***

## Fluctuation and fractal characteristics of ring like and jet like events produced at SPS energies

DIPAK GHOSH, ARGHA DEB, PRABIR KUMAR HALDAR AND SIMA GUPTARROY ..... 1339

***Optics & Spectroscopy***Optogalvanic detection of NaNe and Na<sub>2</sub> in a hollow cathode lamp

S B RAI AND SHIV KUMAR SINGH ..... 885

## Applications of degenerate/non-degenerate modes coupling in an optical waveguide

SANJEEV KUMAR RAGHUWANSHI AND SRINIVAS TALABATTULA ..... 1373

UV-visible-near IR and infrared spectroscopy of  $\beta$ -carotene and  $\beta$ -carotene-iodine complex

A T OZA, G K SOLANKI, ANAND AMIN AND PARIMAL TRIVEDI ..... 1513

## A new band system of the MgBr molecule

K N UTTAM, RENU SINGH AND PAVITRA TANDON ..... 1523

## Asymmetric group velocity dispersion and pulse distortion in a uniform fiber Bragg grating

SANJEEV KUMAR RAGHUWANSHI AND SRINIVAS TALABATTULA ..... 1681

## ***Particle Physics***

Spontaneous symmetry breakdown and critical perspectives of Higgs Mechanism

NILS M BEZARES-RODER AND HEMWATI NANDAN ..... 69

A model for quark-gluon plasma with pentaquark baryons and tetraquark mesons

R S KAUSHAL ..... 891

Calculation of the masses and the running masses of the quarks and leptons from electroweak to supersymmetric grand unification

B B DEO AND P K MISHRA ..... 1529

Interaction of an electric charge in the radial field of a heavy dyon

GAURAV BHAKUNI AND SHUCHI BISHT ..... 1563

## ***Plasma Physics***

Large amplitude solitary waves in four component dusty plasma

PRASANTA CHATTERJEE AND SANJIB KUMAR KUNDU ..... 447

Solitary waves in dusty plasmas with variable dust charge and nonthermal ions

HAMID REZA PAKZAD AND KUROSH JAVIDAN ..... 1689

## ***Statistical Physics***

Mixing dynamics and microscopic correlation of associated liquids

G G BORTHAKUR AND B BAISHYA ..... 459

Self consistent microscopic theory of frictional ratchet in a nonequilibrium environment

JYOTIPRATIM RAY CHAUDHURI AND DEBASHIS BARIK ..... 1577

## ***Notes***

Periodicity of ~155 days in solar electron fluence

PARTHA CHOWDHURY, P C RAY AND SAIBAL RAY ..... 95

Critical behaviour of the thermodynamic quantities near the melting point in the solid phase of hexadecane

H YURTSEVEN AND Ö TILKI ..... 105



## Electronic spectral studies of 4-bromo-2-fluoro phenol in various solvents

M K YADAV AND SURBHI ..... 117

## On entropy and objective reality

MENDEL SACHS ..... 907

## A note on the dynamical structure of liquid LiNa alloy

P P NATH AND R N JOARDER ..... 913

## Optical and texture property studies in a nematic liquid crystal mixture

JITENDRA KR KUSHWAHA, V P ARORA, K K RAINA AND V K AGARWAL ..... 1385

Double photoionization of Ar ( $1s^2 2s^2 2p^6 3s^2 3p^6$ )  $^1S_0$ 

R KUMAR, R P K RAY AND S N TIWARY ..... 1395

## Surface stress calculation for one-monolayer adsorption of As on the Si(001) and the Ge(001) surfaces

J D DUBEY, J P KUSHWAHA AND BHIMLAL PRASAD ..... 1701

***Proceedings (Part I & II) of the National Symposium entitled Condensed Matter Days-2006 (CMDAYS-06) organised by the Department of Physics, Tezpur University, P.O.-Nappam, Tezpur-784 028, Assam, India, held at Tezpur, India, during August 29-31, 2006***

## • Foreword

D MOHANTA ..... 145

## Ion velocity dependent secondary electron induced point defects in SHI irradiated solids

R BISWAL, J JOHN, D BEHERA, P MALLICK, S KUMAR, D KANJILAL  
AND N C MISHRA ..... 147Effect of Ho and Nd substitution in  $\text{La}_{0.67}\text{Ca}_{0.33}\text{MnO}_3$  CMR manganites

D K MISHRA, P K MISHRA, D R SAHU, D BEHERA AND B K ROUL ..... 155

Structural and optical properties of 150 MeVTr<sup>+11</sup> irradiated doped nanostructuresU DAS, D MOHANTA, A K BORDOLOI, F SINGH, A TRIPATHI,  
D K AVASTHI AND A CHOUDHURY ..... 163

## Magnetic and martensitic transformations in Ni-Fe-Ga alloy

M RAGHUSANKAR, SIDANANDA SARMA, S RAVI AND A SRINIVASAN ..... 169

# Orientation of carbazole molecule in the mixed Langmuir-Blodgett films

S BISWAS, S A HUSSAIN AND D BHATTACHARJEE ..... 173

# Steady state photo carrier grating technique for measurement of charge carrier diffusion length

PURABI GOGOI, TAUFIQUE A ANSARI AND PRATIMA AGARWAL ..... 179

# Complex envelope soliton in Bose-Einstein condensate with time dependent scattering length

AYAN KHAN, RAJNEESH ATRE AND PRASANTA K PANIGRAHI ..... 185

# Physico-chemical characteristics of ground water of Tezpur town

KALI PRASAD SARMA AND MONIMALA DAS ..... 189

# Preparation, characterization and magnetic properties of hexagonal $Y_{1-x}Ce_xMnO_3$

S K SRIVASTAVA, MANORANJAN KAR AND S RAVI ..... 195

# Chaotic behaviour of population on a square lattice

TAPATI DUTTA AND SUJATA TARA FADAR ..... 201

# Titanium nitride nano-structure by DC magnetron sputtering plasma

SANKAR MONI BORAH, ARUP RATAN PAL, HEREMBA BAILUNG

AND JOYANTI CHUTIA ..... 209

# Study of antiferromagnetism in cuprates through Raman active phonon peaks

K C BISHOYI AND G C ROUT ..... 215

# Electrical characterization of multiwalled carbon nanotubes synthesized by DC-plasma enhanced chemical vapor deposition technique

SK F AHMED, M K MITRA AND K K CHATTOPADHYAY ..... 223

# Variational Monte Carlo study of magnetic correlations in bilayer $t$ - $J$ model

AMAL MEDHI, SAURABH BASU AND C Y KADOLKAR ..... 251

# Study of elemental composition in some II-VI oxides by atomic absorption spectroscopy

UDAYAN DE, MANISHA VENKATESH, MEHZABIN S SHAIKH AND

B VENKATARAMANI ..... 259

# Silicon oxinitride: a material for compact waveguide device

P P SAHU ..... 265

Swift  $\text{Ni}^{2+}$  ion irradiation effects on electrodeposited polypyrrole for application .  
as electrode in supercapacitors

A KUMAR, A M P HUSSAIN AND D K AVASTHI ..... 273

Persistent current and low-field magnetic susceptibility in  $n$ -fold twisted  
Moebius strips

SANTANU K MAITI ..... 281

$d$ -wave correlations for anisotropic superconductors

POULUMI DEV AND SAURABH BASU ..... 289

Sandpile under rotational constraint

S B SANTRA AND D DEB ..... 295

Optical and electrical properties of thermally evaporated ZnSe thin films

S CHALIHA, M N BORAH, P C SARMAH AND A RAHMAN ..... 303

Optical and structural studies of SHI irradiated  $\text{SiO}_2$  coated IV-VI  
semiconductor quantum dots

S CHOWDHURY AND A CHOUDHURY ..... 311

Microscopic inhomogeneity induced thermal fluctuation in high temperature  
superconductors

D BEHERA, R BISWAL, U K MOHAPATRA AND N C MISHRA ..... 317

Synthesis and characterizations of quality PbS quantum dots in SBR matrix

N DUTTA, D MOHANTA AND A CHOUDHURY ..... 327

A plausible explanation of non-zero isotope shifts in superconductors

B BANERJEE AND S K ROY ..... 333

Development of LDPE/ $\text{TiO}_2$  composite as substrate material in microwave  
integrated circuits

A GOGOI AND N S BHATTACHARYYA ..... 341

Electrochemical synthesis and characterization of co-polymers of aniline and  
pyrrole .

A M PHARHAD HUSSAIN AND A KUMAR ..... 349

Finite-size-scaling theory for anisotropic percolation models

SANTANU SINHA AND S B SANTRA ..... 919

***Proceedings (Part I & II) of the 5<sup>th</sup> Biennial Conference of the Physics Academy of the North East (PANE) held at Department of Physics, Gauhati University, Guwahati-781 014, Assam, India during March 1-2, 2007***

***Foreword***

DILIP KUMAR CHOUDHURY AND BUDDHADEB BHATTACHARJEE ..... 495

**Use of low energy accelerators**

AMIT ROY ..... 497

***Invited Talk***

**Fragility of Pb modified germanium chalcogenide glasses**

A SRINIVASAN AND A K PATTANAIK ..... 505

**Bianchi type-1 string cosmology with a scalar field**

K K BARUAH ..... 513

**The space distribution of QSOs**

FROM ABLU MEITEI AND K YUGINDRO SINGH ..... 519

**The rapid neutron capture process in an explosive astrophysical environment**

RULEE BARUAH, KALPANA DUORAH AND H L DUORAH ..... 523

**Raychaudhuri equation, big bang and accelerating universe**

K D KRORI, SABITA DUTTA, KANIKA DAS AND CHANDRA REKHA MAHANTA ..... 531

**Studies on water vapour droplets using a laser based air quality monitoring system**

D DAS, G A AHMED AND A CHOUDHURY ..... 539

**Correlation distance of ionospheric total electron content in the Indian low latitude region**

RASHMI REKHA BORAH, K BHUYAN AND P K BHUYAN ..... 545

**Dirac and Infeld-Hull ladder operator methods for a modified oscillator potential**

O BABYNANDA DEVI AND C AMUBA SINGH ..... 551

**Algebraic approach to analyze the vibrational spectra of tetrahedral molecules**

JOYDEEP CHOUDHURY, NIRMAL KUMAR SARKAR AND

RAMENDU BHATTACHARJEE ..... 561

A T-matrix approach for morphological characterization of spherical nanoparticles using laser	
ANKUR GOGOI AND GAZI AMEEN AHMED .....	567
Solvent dependent Raman anisotropic bandwidth study in carbonyl containing molecule: role of van der Waals' volume in intermolecular interactions	
TH GOMTI DEVI AND K KUMAR .....	571
Performance of thermally deposited polycrystalline Ge-thin film transistors with a copper interlayer fabricated on glass substrates	
P GOGOI, K KONWAR AND B BAISHYA .....	577
Effect of wavelength and intensity of illumination on the photoelectronic properties of CdSe thin films	
K SARMAH, R SARMA AND H L DAS .....	585
A study of current - voltage characteristics of ITO/(p)Si heterojunctions	
S CHALIHA, M N BORAH, P C SARMAH AND A RAHMAN .....	595
Study of critical current density from ac susceptibility measurements in $(\text{La}_{1-x}\text{Y}_x)_2\text{Ba}_2\text{CaCu}_5\text{O}_z$ superconductors	
P K NAYAK AND S RAVI .....	603
Synthesis of lithium zinc ferrite powders by citrate precursor gel formation method	
IBETOMBI SOIBAM, SUMITRA PHANJOURAM, H BASANTKUMAR SHARMA AND H N K SARMA .....	611
A numerical model for studying glass dissolution in water	
S B SANTRA AND S RANJITA CHANU .....	615
An analysis of self-similarity in quark and gluon densities at small x	
D K CHOUDHURY AND RUPJYOTI GOGOI .....	621
Programmable trigger circuit for UHE cosmic ray detection by mini-array method : simulation with VHDL	
NAYANMONI SAIKIA, BANTY TIRU, DUDUMONI HANDIQUE, P K BORUAH AND K BORUAH .....	627
Emission characteristics of intermediate mass fragments on the residual part of the projectile nucleus	
B DEBNATH, R TALUKDAR AND B BHATTACHARJEE .....	633

## Direct derivation of Sagnac effect

K D KRORI, SABITA DUTTA AND KANIKA DAS ..... 665

## Nucleocosmochronology of Dergaon meteorite

P DUTTA, K DUORAH AND H L DUORAH ..... 673

## Cavity-modified laser induced fluorescence of a blended system of polymer film

R CHANGMAI AND G D BARUAH ..... 679

## Microstructures, stress, strain and surface characterization of TD polycrystalline CdS thin films

K KUNJABALI SINGH AND H L DAS ..... 685

Electrical transport and magnetic properties of  $\text{La}_{0.85}\text{Ag}_{0.15}(\text{Mn}_{1-y}\text{Al}_y)\text{O}_3$  compounds

S K SRIVASTAVA, MANORANJAN KAR AND S RAVI ..... 695

## Influence of cooling rate on the properties of ferromagnetic shape memory alloy

SIDANANDA SARMA AND A SRINIVASAN ..... 701

## Synthesis and optical characterization of CdS nanocomposites

R DEVI, P K KALITA, P PURKAYASTHA AND B K SARMA ..... 707

## Fabrication of silver/cross-linked polyvinyl alcohol nanoparticles by hydrothermal method

S DEB AND D SARKAR ..... 715

Naphthacene and pentacene based organic thin film transistors with  $\text{La}_2\text{O}_3$  as the gate insulator

K KONWAR, P GOGOI AND B BAISHYA ..... 719

## Comparative studies on optical parameters of CdTe and ZnO thin films

G WARY AND A RAHMAN ..... 723

## Application of projection operator method to define basis functions for use in photoemission calculations

B ZOLIANA AND R K THAPA ..... 729

Effect of collision geometry on the multiplicity of secondary charged particles emitted from  $^{84}\text{Kr}$ -AgBr interactions at 950 MeV/A

B BHATTACHARJEE, B DEBNATH AND S SENGUPTA ..... 735

# Hardness study of titanium nitride thin films deposited on bell-metal by cylindrical magnetron sputtering

SANKAR MONII BORAH, ARUP RATAN PAL, HEREMBA BAILUNG

AND JOYANTI CHUTIA ..... 741

# Proton induced X-ray emission (PIXE) and proton induced $\gamma$ -ray emission (PIGE) studies of some medicinal plants of north east India

K NOMITA DEVI, H NANDAKUMAR SARMA AND SANJIV KUMAR ..... 747

# Type-II seesaw in SO(10) theories with spontaneous CP violation

K BORA ..... 753

# Vector model of quantum interference laser

FARZANA B HAZARIKA AND G D BARUAH ..... 761

# Algebraic approach : study of vibrational spectra of some linear triatomic molecules

NIRMAL KUMAR SARKAR, JOYDEEP CHOUDHURY AND

RAMENDU BHATTACHARJEE ..... 767

# X-ray and infrared spectroscopic studies of the molecular structure of 3-(2,4-dichlorophenyl)-1-phenylprop-2-en-1-one

MANISHA PHUKAN AND B K SARMA ..... 773

# Form factors and charge radii of light and heavy flavoured mesons in a QCD inspired quark model with two loop static potential

NAMITA SHARMA BORDOLOI AND D K CHOUDHURY ..... 779

# Quark contribution in the evolution equation of the scaling violation of $F_2$

ABHIJEET DAS AND A SAIKIA ..... 789

# Field effect transistor from dispersion polymerized aniline

J BHADRA AND D SARKAR ..... 795

# Interaction of loosely bound radioactive and stable nuclei via elastic scattering and fusion cross sections

K KALITA ..... 801

# ***Special Issue on 80 years of the Discovery of Raman Effect & 175th Birth Anniversary of Dr. Mahendra Lal Sircar***

# Foreword

EDITOR-IN-CHIEF, IJP ..... 949

***Reprinted from Indian Journal of Physics Vol. II and  
Proceedings of the Indian Association for the Cultivation of  
Science Vol. XI***

***Vol. II, Part III (24) pp 387-398 (1927-1928)***

**A New Radiation**

PROF. C V RAMAN, FRS ..... 951

***The Discovery of the Raman Effect***

80 years ago – the Discovery of the Raman Effect at the Indian  
Association for the Cultivation of Science, Kolkata, India

RAJINDER SINGH ..... 969

**Raman optical activity : a novel version of chiroptical spectroscopy**

MOITRAYEE MUKHERJEE, ANAMIKA MUKHOPADHYAY AND TAPAS CHAKRABORTY ..... 987

**Cultivation of Science in the 19th Century Bengal**

RAJESH KOCHHAR ..... 1003

***Special Issue on “Electrodynamics of Classical Charged  
Particles”***

***Foreword***

JOSE LUIZ LOPEZ-BONILLA ..... 1103

**Hidden symmetries of the motion of a charged particle in a uniform  
magnetic field**

G F TORRES DEL CASTILLO ..... 1105

**The significance of the Schott energy in the electrodynamics of charged  
particles and their fields**

E ERIKSEN AND Ø GRØN ..... 1113

**Two-body problem with retarded interactions and radiation reaction in  
classical electrodynamics**

YURIJ YAREMKO ..... 1139

**Proper-time foundations for classical electrodynamics**

TEPPER L GILL AND WOODFORD W ZACHARY ..... 1159



A deduction of the Landau-Lifshitz equation of motion without mass renormalization in classical electrodynamics

G ARES DE PARGA, M ORTIZ-DOMINGUEZ AND R MARES ..... 1179

Electromagnetic mass model admitting conformal motion

SAIBAL RAY, A A USMANI, F RAHAMAN, M KALAM AND K CHAKRABORTY ..... 1191

Expanding the realm of 'classical' electrodynamics

CYNTHIA KOLB WHITNEY ..... 1205

## ***Erratum***

A minimum electrophilicity perspective of the HSAB principle

P K CHATTARAJ AND S GIRI ..... 467